

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-5. (Canceled)

6. (currently amended) A method of emulating a handheld video game device of the type that includes a handheld housing having an electronic display thereon, said handheld housing having therein a processor that runs a video game software image out of a page-based read only memory (ROM) to present interactive displays on said electronic display of animated video game play in response to user inputs, the method comprising:

~~launching and~~ executing a video game device emulator program on a target computing device different from said handheld video game device including said handheld housing having said electronic display thereon, said target computing device being capable of displaying graphical information on a target computing device display, said target computing device having read/write memory and receiving user inputs, said ~~launched and~~ executing video game device emulator program controlling said target computing device to at least in part emulate said handheld video game device so as to at least in part enable said target computing device to run said video game software and present interactive displays of said animated video game play on said target computing device display in response to user inputs to said target computing platform;

modeling at least some display timing activities of said handheld video game device electronic display on said target computing device;

processing, with said emulator program executing on said target computing device, a said video game software image capable of being executed on said handheld video game device processor within said handheld housing that runs video game software to present interactive displays on said electronic display of animated video game play in response to user inputs; and

generating a real time interactive video game presentation on said target computing device display at least in part in response to said processed video game software image and said modeled display timing activities,

~~wherein the target computing device display has a predetermined display area, and said video game device emulator program displays at least a portion of said real time interactive video game presentation on a subset of said predetermined display area,~~

wherein said video game software image comprises multiple ROM pages and said method further includes said emulator program providing a pointer table system that allocates emulated ROM pages in said target computing device read/write memory and duplicates at least a portion of said allocated emulated ROM pages across said ROM pages to facilitate page selection and reduce page swapping.

7-13. (Canceled)

14. (currently amended) An emulator that emulates in software, at least a portion of handheld video game platform hardware of the type including a handheld housing having an electronic display thereon, said handheld housing having therein a processor that runs video game software, said handheld housing accepting a pluggable memory cartridge including a read only memory (ROM) therein providing a video game software

image comprising multiple ROM pages, said handheld video game platform processor executing said video game software image from said multiple ROM pages to present interactive displays on said electronic display of animated video game play in response to user inputs, said emulator comprising:

a target platform different from said handheld video game platform hardware, said target platform including a processor that loads and executes emulation software, parses and processes a ROM page based video game software image capable of being executed on said handheld video game platform hardware processor, and generates an audio-visual real time interactive presentation in response to said image,

~~wherein the target platform comprises a display unit having a predetermined display area, and said target platform under control of said emulation software displays the visual part of said audio-visual presentation on a subset of said display unit predetermined display area,~~

wherein said video game software image comprises multiple ROM pages and said emulator provides a pointer table system that allocates emulated ROM pages in target platform read/write memory and duplicates at least a portion of said allocated emulated ROM pages across said allocated ROM pages to facilitate paging operations and reduce page swapping.

15-16. (Canceled)

17. (previously presented) The method of claim 6 wherein said target computing device display comprises a liquid crystal display.

18. (currently amended) The method of claim 6 wherein said handheld display comprises a liquid crystal display and said modeling comprises modeling a virtual liquid

crystal display controller state machine corresponding to said handheld liquid crystal display to maintain real time synchronization with events as they would occur on said handheld video game device.

19. (previously presented) The method of claim 6 further including using hardware-assisted BLIT memory transfer operations to efficiently transfer graphics information.

20. (previously presented) The method of claim 6 further including using a pre-computed translation table that translates native platform graphics character formats.

21. (previously presented) The method of claim 6 further including emulating registers and hardware-based memory structures within the handheld video game device in random access memory under software control.

22. (previously presented) The method of claim 6 further including using a jump table to efficiently parse incoming binary instruction formats.

23. (currently amended) The method of claim 6 further including using said pointer table system to control memory access by remapping memory access instructions into ~~different memory locations and/or~~ function calls.

24. (currently amended) The method of claim 6 further including ~~providing using~~ said pointer table system to implement a read only memory protection function to eliminate overwriting of read only memory.

25. (previously presented) The method of claim 6 wherein said modeling includes using a state machine defining at least a horizontal blank state and a vertical blank state.

26. (previously presented) The method of claim 25 further including providing a cycle timer to determine when a modeled state has expired and transition to a new state is desired.

27. (previously presented) The method of claim 6 further including selectively skipping frames while maintaining execution of instructions to maintain state information while minimizing game play slowdowns.

28. (previously presented) The method of claim 6 further including performing no-operation look-ahead to avoid wasting processing time in no-operation loops.

29. (currently amended) The method of claim 6 further including modeling ~~said~~ each handheld video game device native instruction ~~registers~~ register as a union of byte, word and long register formats.

30. (previously presented) The method of claim 6 further including modeling handheld video game device native instruction CPU flags to allow efficient updating after operations are performed by the target computing device.

31. (previously presented) The method of claim 6 further including mapping the handheld video game device emulated program counter into at least one target computing device microprocessor general purpose register.

32. (previously presented) The method of claim 6 further including providing an adaptable input controller emulator to receive user inputs from a variety of different user input devices.

33. (previously presented) The method of claim 6 further including using screen memory buffers larger than said predetermined display area to increase paging

efficiency by eliminating clipping calculations and using hardware Bitblit to transfer a subset of said memory buffer to display video memory.

34. (previously presented) The method of claim 6 wherein said target computing device comprises an airline seat back controller.

35. (previously presented) The method of claim 6 wherein said target computing device comprises a personal digital assistant (PDA).

36. (previously presented) The method of claim 6 wherein said target computing device comprises a handheld portable computing device.

37. (currently amended) A storage device storing emulation software for emulating at least a portion of the functionality of handheld video game platform hardware on a portable handheld battery-operated computing device different from said handheld video game platform hardware, said handheld video game platform hardware of the type that includes a handheld housing having an electronic display thereon, said handheld housing having therein a processor that runs a video game software image out of a page-based read only memory (ROM) to present interactive displays on said electronic display of animated video game play in response to user inputs, said portable handheld battery-operated computing device of the type including a display unit having a predetermined display area and further including a processor that loads and executes said stored emulation software to enable video game play on said portable handheld battery-operated computing device, said storage device storing:

first emulation program instructions that process a page-based read only memory (ROM) video game software image capable of being executed on said handheld video

game platform hardware, said video game software image comprising multiple ROM pages;

second emulation program instructions that generate an audio-visual real time interactive presentation at least in part in response to said video game software image, said second emulation program instructions displaying an animated character visual part of said audio-visual presentation on a subset of said display unit predetermined display area; and

third emulation program instructions that provide a pointer table system which allocates ROM pages in target platform read/write memory and duplicates at least a portion of said allocated ROM pages across said pages to facilitate paging operations and reduce page swapping.

38. (New) The method of claim 6 further including using said ROM pages to emulate read only memory arrays within a ROM-based pluggable game cartridge.

39. (New) The method of claim 6 further including allocating, in random access memory, at least twice the space occupied by ROM pages in the handheld video game device, and duplicating half of each page allocated in random access memory.

40. (New) The method of claim 6 wherein said handheld video game device is adapted for use with a pluggable game cartridge ROM having ROM banks, and said emulator emulates each of said ROM banks with a different RAM page.

41. (New) The method of claim 6 further including using a ROM selection pointer to select a current ROM page and a ROM page count register to specify the number of emulated ROM pages that have been loaded.

42. (New) The method of claim 6 further including using a no-write functional module to protect allocated emulated ROM space so that inadvertent write instructions do not succeed in overwriting emulated read only memory,

43. (New) The method of claim 6 further including using a no-write function to protect emulated ROM space from being written to, thus making sure the emulated ROM space is emulated as read only memory rather than read-write memory.

44. (New) The method of claim 6 further including using function pointers to implement no-write allocated ROM space protection.

45. (New) The emulator of claim 14 wherein said emulator uses said allocated ROM pages to emulate the cartridge read only memory arrays.

46. (New) The emulator of claim 14 wherein said emulator allocates, in random access memory, at least twice the space occupied by the ROM pages in the handheld video game memory cartridge, and duplicates half of each page allocated in random access memory.

47. (New) The emulator of claim 14 wherein said handheld video game pluggable game cartridge ROM has ROM banks, and said emulator emulates each of said ROM banks with a different RAM page.

48. (New) The emulator of claim 14 wherein said emulator uses a ROM selection pointer to select the current ROM page and a ROM page count register to specify the number of ROM pages that have been loaded.

49. (New) The method of claim 14 wherein said emulator includes a no-write functional module to protect the allocated ROM space so that inadvertent write instructions do not succeed in overwriting emulated read only memory,

50. (New) The emulator of claim 14 further including a no-write function to protect emulated ROM from being written to, thus making sure this memory segment is emulated as read only memory rather than read-write memory.

51. (New). The emulator of claim 14 further including function pointers that implement no-write register handling functions.

52 (New). The storage device of claim 37 further including instructions that use said ROM pages to emulate cartridge read only memory arrays.

53. (New) The storage device of claim 37 further including instructions that allocate, in random access memory, at least twice the space occupied by the ROM pages in the handheld video game platform hardware, and duplicating half of each page allocated in random access memory.

54. (New) The storage device of claim 37 wherein said handheld video game platform hardware is adapted for use with a pluggable game cartridge ROM having ROM banks, and said emulator further includes instructions that emulate each of said ROM banks with a different RAM page.

55. (New) The storage device of claim 37 further including instructions that use a ROM selection pointer to select the current ROM page and a ROM page count register to specify the number of ROM pages that have been loaded.

56. (New) The storage device of claim 37 further including no-write functional module instructions to protect the allocated ROM space so that inadvertent write instructions do not succeed in overwriting emulated read only memory,

57. (New) The storage device of claim 37 further including instructions that use a no-write function to protect emulated ROM from being written to, thus making sure this memory segment is emulated as read only memory rather than read-write memory.

58. (New) The storage device of claim 37 further including instructions that use function pointers to implement no-write register handling functions.